April 14, 1925. 1,533,898

G. J. A. L. PRAT

APPARATUS FOR OBTAINING ARTIFICIAL DRAFT

Filed Aug. 30, 1923 2 Sheets-Sheet 1

Fig. 1.

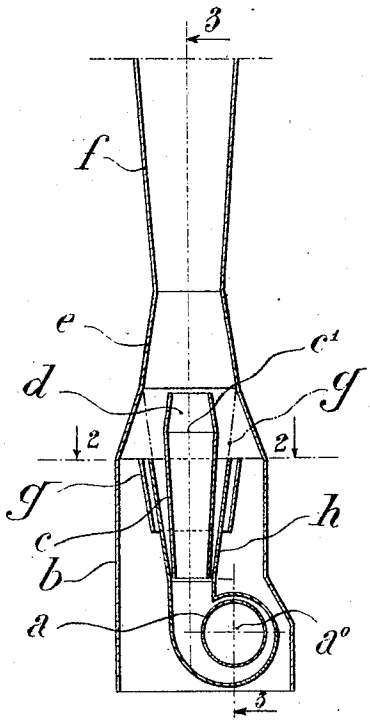


Fig. 3.

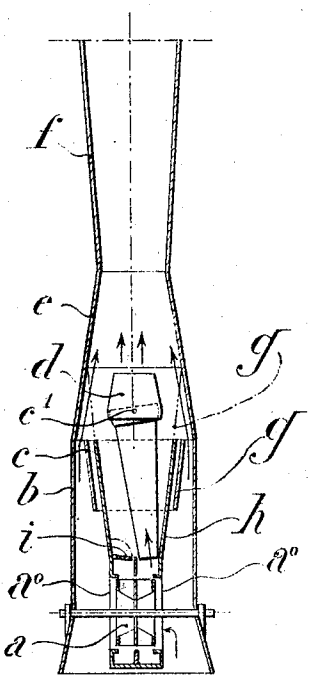
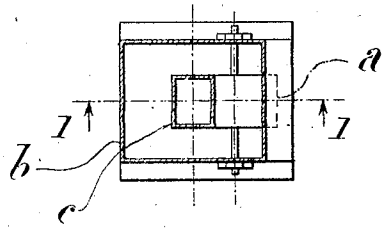


Fig. 2.



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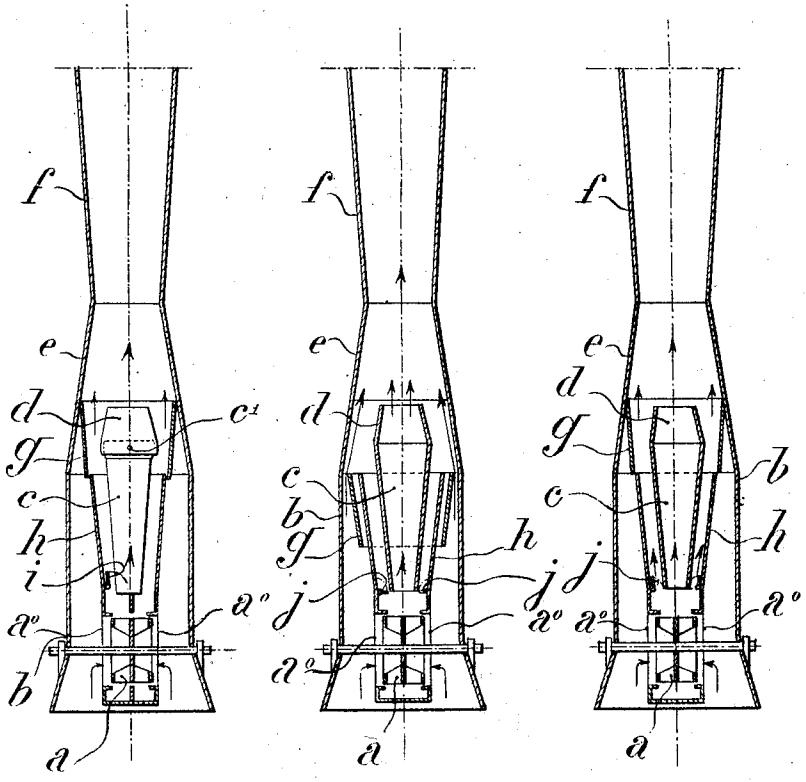
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Fig. 4. Fig. 5. Fig. 6.



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Patented Apr. 14, 1925. 1,533,898

UNITED STATES PATENT OFFICE.

GEORGES JULES ARMAND LOUIS PRAT, OF PARIS, FRANCE.

APPARATUS FOR OBTAINING ARTIFICIAL DRAFT.

Application filed August 30, 1923. Serial No. 660,257.

To all whom it may concern:

Be it known that I, GEORGES JULES ARMAND LOUIS PRAT, manufacturer, citizen of the French Republic, residing at Paris, France, have invented certain new and useful Improvements in Apparatus for Obtaining Artificial Draft, of which the following is a specification.

This invention relates to apparatus for producing artificial draft.

It has for its principal object to so construct apparatus of the character referred to which is more efficient than those heretofore used.

According to the invention the apparatus is so constructed and arranged that while only a single fan or ventilator is utilized, the apparatus may be operated to produce either induced draft or an aspirated draft or suction, whilst at the same time the fan or ventilator gives its full output.

The invention also comprises certain constructional embodiments and modified arrangements which will be more fully explained hereafter.

In order that the invention may be clearly understood, it will be described with reference to the accompanying drawings, but it is to be understood that these drawings are given merely by way of example.

In the drawings:—

Figure 1 represents, in vertical section, on the line 1—1 of Fig. 2, an apparatus embodying the invention and which is capable of producing either an induced or an aspirated draft, the apparatus as shown in this figure being arranged for producing an induced draft;

Fig. 2 represents a cross-section on the line 2—2 of Fig. 1;

Fig. 3 represents a vertical section on the line 3—3 of Fig. 1;

Fig. 4 is a view similar to Fig. 3, but showing the parts of the apparatus in position for producing an aspirated draft;

Fig. 5 is a view similar to Fig. 3 but showing another embodiment of the invention, the parts of the apparatus being shown in this figure in position for induced draft; and

Fig. 6 is a view similar to Fig. 5, but showing the parts of the apparatus in position for aspirated draft.

According to the particular methods of carrying out the invention as illustrated in the drawing which show preferred arrangements for obtaining artificial draft in a chimney in such a way that under the best conditions the draft may be either induced or aspirated, the construction is substantially as follows:

In the first place the ordinary elements usual in an apparatus working with induced draft are employed, that is to say there is a fan or ventilator *a* adapted to work by aspiration or suction, a conduit *b* for the passage of the gases, and a delivery tube terminating in a nozzle *d* located in the axis of the chimney, the chimney comprising the customary mixing chamber *e* and shaft or diffuser *f*. The fan or ventilator *a* is preferably provided with two in-take apertures *a* and the discharge nozzle portion is located in the axis of the chimney.

Means is employed which, when in one position, that is in the position which it occupies when the apparatus is working to produce an induced draft, there is left between the nozzle and the wall of the chimney the normal passage for the gases of combustion not passing through the fan or ventilator: whereas when such means occupies another position, corresponding with the working of the apparatus to produce an aspirated draft, this passage is closed.

Such means may consist of a sort of register or shutter formed by a tubular member *g* and a cooperating housing *h*, also tubular, and surrounding the conduit *c* leading from the nozzle, and connected thereto at its lower end. The construction and arrangement of these parts are such that when the member *g* is out of use, that is, in the position shown in full lines at Figs. 1, 3, or 5, there is space left between the member *g* and the housing *h* and the wall of the chimney for working with induced draft, whilst when the member *g* is in use, or is in the position shown in dotted lines in Figs. 1 and 3 and in full lines on Figs. 4 and 6, the member *g* abuts at its upper edge against the wall of the chimney and it forms an upward prolongation of the housing *h*.

The present invention provides means whereby the aspirating ventilator or fan may employ a different orifice when working to produce an aspirated draft than that which it employs when working to produce an induced draft.

In order to enable this result to be accomplished, the outlet of the ventilator may be of different cross section relatively to

that of the lower extremity of the nozzle pipe *c*.

The construction may be such as shown at Figs. 1, 3 and 4 on the one hand where the nozzle pipe *c* is disconnected from the ventilator or fan and adapted to be oscillated on a horizontal spindle c^1 so that it can take up either the vertical position as shown at Fig. 4 or an inclined position as shown at Fig. 3, in which position the nozzle pipe is in contact at its lower end with the side of the conduit or housing *h* of the ventilator; and a movable shutter or obturator may be provided, such as a shutter *i*, hinged on the opposite side and so that it can be turned out of the way as shown at Fig. 4 or, brought into position, as shown in Fig. 3 to close the space between the lower end of the nozzle pipe *c* and the side of the outlet pipe or housing *h* of the ventilator or fan.

Or again a construction such as that represented in Figs. 5 and 6 may be adopted in which the nozzle pipe *c* is fixed and remains vertical and a set of flaps or shutters *j* is provided, they being hinged like the flap or shutter *i* and serving, when closed, as shown in Fig. 5, to close the spaces within the housing *h* at opposite sides of the lower end of the nozzle pipe *c*.

There may be added for the more efficient working of the shutters for aspiration, apertures in the fan or ventilator.

The general result of this construction is that when the member *g* is in the inoperative position and the shutter *i* or the shutters *j* are closed, as shown in Figs. 3 and 5, respectively, the parts being preferably operated from a single controlling device the construction of which will be obvious, the ventilator or fan delivers only through the pipe *c* and the nozzle *d*, and the apparatus then operates to produce an induced draft.

On the other hand, when the member *g* is in the operative position and the shutter *i* or the shutters *j* are open, as shown in Figs. 4 and 6, respectively, the ventilator draws in the whole of the gases and causes them to pass through the housing *h* and member *g*, as well as through the pipe *c* and the nozzle *d*. This is the position of the member *g* and shutter *i* or shutters *j* for aspirated draft.

The present invention provides artificial draft producing apparatus which is capable of operating either by induction or by aspiration and in using either method of operation, it yields high efficiency. When operating to produce an induced draft, all of the gases discharged from the fan or ventilator pass through the nozzle pipe *c*, the shutters then being closed to cut off the discharge of the gases through the housing *h* which surrounds the nozzle pipe, and, hence, high velocity of gases are produced at the discharge nozzle which results in efficient induction of the gases through the spaces or passages between the wall of the chimney and the member *g*, the latter being then in its lowered or inoperative position, as shown by the full lines in Figures 1, 3 and 5 and between the member *g* and through the space which then exists between the member *g* and the housing *h*. When the apparatus is operated to produce an aspirated draft, in which case the member *g* is raised to the position shown in Figures 4 and 6 and hence forms a continuous conduit between the housing *h* and the chimney, the shutter *i* or the shutters *j* are open and, hence, the gases are discharged from the fan or ventilator through the two outlets, i. e., the nozzle pipe *c* and the surrounding housing *h* and member *g*. The invention thereby enables the apparatus to be operated to best advantage to suit the volume of gases to be evacuated, and, moreover, the apparatus may be operated to evacuate gases at different rates while the fan or ventilator may be operated at the same speed.

As will be readily understood and as has moreover been already stated the invention is not limited to the particular constructional embodiments which have been described above, but all modifications coming within a fair interpretation of the claims are included.

What I claim as my invention and desire to secure by Letters Patent of the United States of America, is:—

1. In apparatus for producing artificial draft in chimneys, the combination of a fan or ventilator having a discharge nozzle opening to the chimney, a housing around said nozzle and communicating at one end with the outlet of the fan and providing a passage between its other end and the chimney wall, means for opening or closing said passage whereby the apparatus may operate to produce either an induced or an aspirated draft, and means whereby the discharge of the fan may take place through the nozzle alone or through the nozzle and housing.

2. In apparatus for producing artificial draft in chimneys, the combination of a fan or ventilator having a discharge nozzle communicating with the chimney, a tapering housing around the nozzle and communicating at one end with the discharge of the fan, a tapering member cooperative with the tapering housing and operative to produce a draft inducing passage between the outer side of the housing and the chimney wall or to form a continuation of said housing and close such passage, and means whereby the discharge from the fan may take place either through the nozzle alone or through the nozzle and said housing and member.

3. In apparatus for producing artificial

draft in chimneys, the combination of a fan or ventilator having a discharge nozzle which projects upwardly into the chimney, a housing communicating at one end with the discharge of the fan and forming a draft inducing passage between its upper end and the chimney wall, a member movable into a position to close or open said draft inducing passage, and shutter means in the housing operative, when closed, to cut off the discharge from the fan through the housing and operative, when open, to permit the fan discharge to take place through the housing and also the nozzle.

In testimony whereof I have hereunto set my hand.

GEORGES JULES ARMAND LOUIS PRAT.